PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/507,507	Group Art Unit:	1791
Filing Date:	September 13, 2004	Examiner:	Dimple N. BODAWALA
Applicant:	Akio OZASA, et al.		
Title:	METHOD AND MOLD FOR MANUFACTURING BIODEGRADABLE MOLDED ARTICLES		
Attorney Docket:	12480-000061/US		

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July 27, 2010

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellants submit the following Appeal Brief.

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I. REAL PARTY IN INTEREST

The real party in interest for the present application is Nissei Kabushiki Kaisha. An assignment of the rights associated with the present application was recorded with the United States Patent and Trademark Office on September 13, 2004 on reel/frame no. 016819/0242.

II. RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will affect, be directly affected by, or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 1-19 and 26-41 are pending, and remain finally rejected, in the current application. Claims 1, 6, 9 and 13 are the independent claims. Claims 9-11, 31, 33, 37, 39 and 40 are allowed. Claims 20-25 and 42-43 were previously cancelled. No claim amendments are being filed in conjunction with this request. The claims are rejected as follows:

1. Claims 1-6, 12-18, 26-28, 32, 34-36, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen, U.S. Patent No. 5,783,126 (Andersen) in view of Doane, U.S. Patent No. 6,040,063 (Doane); and

2. Claims 19 and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen in view of Doane, further in view of Okazaki EP 0679509 (Okazaki).

See, e.g., Final Office Action dated April 27, 2010 ("Final OA"), p. 2 and p. 10.

Claims 1-8, 12-19, 26-30, 32, 34-36, 38, and 41 are being appealed.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the April 27, 2010 Final Office Action.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following explains the subject matter set forth in each claim argued on appeal by way of example embodiments in the specification by page and line number. This concise explanation relies on example embodiments from the specification to describe the claims; however, the claims recite subject matter not limited to these example embodiments. Independent claims 1, 6, 9 and 13 are argued on appeal and discussed below.

B. Concise explanation of the subject matter set forth in each independent claim

1. An explanation of the subject matter set forth in each independent claim.

a) Independent Claim 1

Independent claim 1 recites "[a] method to manufacture a biodegradable molded article". This reads on the example embodiment on p. 14, lines 12-13 of the original specification. Claim 1 also recites "providing a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water therewith". This reads on the example embodiment on p. 18, lines 4-6 of the original specification. Claim 1 additionally recites "providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity". This reads on the example embodiment on p. 15, lines 15-17 of the original specification. Claim 1 further recites "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film". This reads on the example embodiment on p. 14, lines 23-25 of the original specification. Claim 1 also recites "heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding". This reads on the example embodiment on p. 14, lines 23-25 – p. 15, lines 1-3 of the original specification. Claim 1 additionally recites "wherein said mold has an exhaust hole; and in the heating and molding step, a gas existing between the coating film and a surface of the

mold is discharged out of the cavity through the exhaust hole". This reads on the example embodiment on p. 16, lines 11-15 of the original specification.

b) Independent Claim 6

Independent claim 6 recites "[a] method to manufacture a biodegradable molded article". This reads on the example embodiment on p. 14, lines 12-13 of the original specification. Claim 6 also recites "providing a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto". This reads on the example embodiment on p. 18, lines 4-6 of the original specification. Claim 6 additionally recites "providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity". This reads on the example embodiment on p. 15, lines 15-17 of the original specification. Claim 6 further recites "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film". This reads on the example embodiment on p. 14, lines 23-25 of the original specification. Claim 6 also recites "heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding". This reads on the example embodiment on p. 14, lines 23-25 – p. 15, lines 1-3 of the original specification. Claim 6 additionally recites "wherein the given-shaped cavity of the mold has a deep drawing shape, and the molding material and the coating film placed therein are substantially flat for heating and molding to manufacture a biodegradable molded article of a deep drawing shape". This reads on the example embodiment on p. 23, lines 10-19 of the original specification.

c) Independent Claim 13

Independent claim 13 recites "[a] method to manufacture a biodegradable molded article". This reads on the example embodiment on p. 14, lines 12-13 of the original specification. Claim 13 also recites "providing a slurry or dough molding

material mainly made of starch or a derivative thereof and obtained by adding water thereto". This reads on the example embodiment on p. 18, lines 4-6 of the original specification. Claim 13 additionally recites "providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity". This reads on the example embodiment on p. 15, lines 15-17 of the original specification. Claim 13 further recites "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film". This reads on the example embodiment on p. 14, lines 23-25 of the original specification. Claim 13 also recites "heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the biodegradable expanded molded article through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article". This reads on the example embodiment on p. 14, lines 23-25 – p. 15, lines 1-3 of the original specification. Claim 13 additionally recites "said heating being done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than a melting point thereof". This reads on the example embodiment on p. 114, lines 13-17 of the original specification.

2. A general discussion of the subject matter, described in the specification to assist the Board in understanding example embodiments described in the present application.

As is illustrated in paragraphs [0132] – [0136] of the present application, a method to manufacture the biodegradable molded article includes attaching the coating film directly to the expanded molded article simultaneously with the steam expansion molding of the molding material. This method allows for reduction in the number of manufacturing processes, for example, the coating film can be attached in one process at a minimum. Also, since it is possible to attach by one process, it can shorten time necessary for production, thereby enhancing production efficiency of the biodegradable molded article in accordance with example embodiments.

Further, the coating film is attached at a temperature between the softening point (temperature when softening starts) of a biodegradable plastic that is a main

ingredient of the coating film and less than the melting point thereof simultaneously with steam expansion molding of the molding material. Accordingly, the coating film faces the expanded molded article during an expansion molding process under a heated and pressurized condition. Therefore, the coating film is pressurized from the outside by the mold, and from the inside by the expanded molded article during the expanding and molding process, which results in a coating film that is fused and adhered to a surface of the expanded molded article.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Review is requested for the rejections of (i) Claims 1-6, 12-18, 26-28, 32, 34-36, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen, U.S. Patent No. 5,783,126 (Andersen) in view of Doane, U.S. Patent No. 6,040,063 (Doane); and (ii) Claims 19 and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen in view of Doane, further in view of Okazaki EP 0679509 (Okazaki).

Claims 1-8, 12-19, 26-30, 32, 34-36, 38, and 41 are being appealed, and claims 1-5, 7-8, 12, 14-19 and 26-28, claims 6, 29-30, 32, 36, 38 and 41, and claims 13 and 34-35 rise and fall together, respectively.

VII. ARGUMENT

Appellants submit that claims 1-8, 12-19, 26-30, 32, 34-36, 38 and 41 are patentable for features that are present in each claim, nevertheless Appellants submit that the claims are argued in three groups. Group I includes claims 1-5, 7-8, 12, 14-19 and 26-28, which rise and fall together, with claim 1 being representative. Group II includes claims 6, 29-30, 32, 36, 38 and 41, which rise and fall together, with claim 6 being representative. Group III includes claims 13 and 34-35, which rise and fall together, with claim 13 being representative.

A. Claims 1-6, 12-18, 26-28, 32, 34-36, and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen, U.S. Patent No. 5,783,126 (Andersen) in view of Doane, U.S. Patent No. 6,040,063 (Doane).

a. Independent Claim 1

For at least the reasons given below, Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or a combination thereof teaches or suggests "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 1.

i. A PRIMA FACIE CASE OF OBVIOUSNESS HAS NOT BEEN ESTABLISHED

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness when rejecting claim 1. In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation or success. Finally, the prior art reference or knowledge generally available to one of ordinary skill in the art must teach or suggest all the claim limitations.

Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or combination thereof teaches or suggests all the claim limitations as disclosed in claim 1.[1]

Further, in the Response to Arguments section of the Final OA,[2] the Examiner cites *In re Keller*[3] as stating "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references". Looking closer at the facts of *In re Keller*, the CCPA affirmed the Board's decision that, under the facts of the case, one cannot show objective evidence of non-obviousness by "attacking references individually" when the rejection is based upon a combination.[4] However, the rebuttal evidence consisted only of a single affidavit that only attacked the single secondary reference, and thus, was insufficient evidence of non-obviousness to overcome the rejection.

However, where **none** of the references teach or suggest a particular limitation of the claimed invention, each of the references can be attacked individually to show that the combination fails to support a prima facie case of obviousness. Appellants are arguing against both of the cited references and the combination thereof rather than a singular secondary reference, and therefore, the facts of *In re Keller* do not apply.

ii. NEITHER ANDERSEN, DOANE NOR THE COMBINATION THEREOF TEACHES OR SUGGESTS ALL OF THE LIMITATIONS AS RECITED IN INDEPENDENT CLAIM 1

The Final OA acknowledges that Andersen fails to disclose all of the limitations of claim 1, for example, providing a coating film distinct from the molding material or

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[1] "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found that the claimed invention to have been obvious in light of the teachings of the references.". *Ex parte Clapp* 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

[2] See Final OA, p. 12 at 30.

[3] *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

[4] See *In re Keller* at 425-426.

placing the molding material and the coating film into a mold having a given-shaped cavity, and relies on the teachings of Doane for these features of claim 1.[5]

In addition to the above-identified deficiency of Andersen, Appellants respectfully submit that neither Anderson, Doane nor the combination thereof teaches or suggests heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding as recited in independent claim 1. As Andersen does not provide the coating film distinct from the molding material, there is no pressure-bonding of the coating film to a surface of a biodegradable expanded molded article through steam expansion molding as recited in claim 1, but rather the mold is solely heated through the steam. In other words, Andersen only discloses heating a mold.[6] Andersen describes a coating material that melts to cover the surface of a mixture while the mixture (molding material) is being heated if the coating material is added during expansion molding.[7] Therefore, the method of Anderson is to mold a mixture through expansion and at the same time melt a coating material to form a coating film. Therefore, Appellants respectfully submit that Andersen does not teach or suggest "to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in independent claim 1.

The Examiner relies on Example 6 of Doane to teach "molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article" as recited in claim 1.

However, Appellants respectfully submit that Example 6 of Doane only discloses that "coating was accomplished by placing the films on one or both sides of the selected substrates, then placing the assembly between metal plates in a Carver press and compressing at an elevated temperature and pressure"[8]. The substrates in Doane

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[5] See Final OA, p. 4, lines 1-4.
[6] See *Andersen*, column 45, lines 1-10.
[7] *Id.*, column 49, lines 13-20.
[8] See *Doane*, column 13, line 40 – column 14, line 31.

are starch and PVOH blend films, for example. As such, the substrates would have been already molded before the coating was accomplished. Accordingly, Appellants submit that no steam expansion occurs by compressing the substrates at an elevated temperature and pressure. Therefore, Example 6 of Doane neither discloses nor suggests molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article as recited in claim 1.

Furthermore, the Examiner asserts that "(Doane) teaches that...the coating material is *not* mixed with foam material, but coating material is provided separately from the molding material".[9]

However, Appellants respectfully submit that the Examiner confuses (i) the expanded molded article (foam material) of a non-fluid state which is obtained through the expansion molding with (ii) the slurry or dough molding material of a fluid state which is prepared before the expansion molding. The expanded molded article and the slurry or dough molding material are utterly different in state (fluid state or non-fluid state), and therefore cannot be considered to be identical. Doane teaches that the coating material is provided without being mixed with foam material, that is, the coating material is provided separately from the expanded molded article[10], which is acknowledged also by the Examiner.[11] As such, Doane neither teaches nor suggests a coating film distinct from the slurry or dough molding material being placed into a mold along with the slurry or dough molding material as recited in claim 1.

The Examiner also asserts that the compression molding technique for applying the coating material of Doane inherently teaches that the invention is capable of applying the coating film with a desired bond on the surface molding material into a mold.[12] However, the compression molding technique of Doane is applied to the expanded molded article (self-supporting structure) after the expansion molding[13] is completed. As such, Appellants submit that the

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[9] See Final OA, p. 13, lines 11-16.
[10] See *Doane*, column 4, lines 41-51.
[11] See Final OA, p. 13, lines 11-16.
[12] See Final OA, p. 13, lines 16-20.
[13] See *Doane*, col. 3, line 67 through col. 4, line 19.

compression molding technique for applying the coating material of Doane does not suggest "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 1.

In addition, according to the Examiner, Doane teaches that the polyester film is provided on the thermoformed ribbons of the starch, foam material, ... and thus, such a statement indicates that Doane is capable to apply the coating material on the surface of the molding material by using heat expansion; and a pressure bonding process, in order to melt or soften the coating layer and press bond on the surface the molding material as claimed.[14]

However, as is clear from the description of Doane[15], the method using the thermoformed ribbons is a method in which rigid thermoformed ribbons are compressed so as to assume the shape of the mold cavity, films are placed on the thermoformed ribbons after the mold is opened, the laminates are returned to the molds, and the films are bonded to the thermoformed ribbons. As such, examples of Doane neither disclose nor suggest the feature of claim 1 in which "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article".

Further, Doane states that the hydroxyl-functional polyester is **adherently carried** on the surface of the self-supporting structure and that the polyester **self-adheres** to the surface through brushing, dipping, spraying, compression molding, coextruding and hot roll laminating[16], none of which includes a steam expansion molding method as recited in claim 1. The Examiner asserts that the description in Doane relating to the compression molding of a coating material suggests that Doane is capable of providing a coating film and molding material in a mold during a molding process[17]. However, Appellants submit that the disclosure in Doane is made in relation to the coating of the surface of a self-supporting structure, which is molded in

[14] See Final OA, p. 13, line 20 through p. 14, line 2.
[15] See *Doane*, col. 16, lines 56-63.
[16] *Id.*, at column 4, lines 21-22 and 47-48.
[17] See Final OA, p. 13, lines 26-28.

advance[18], and therefore, Doane does not suggest combining the slurry or dough molding material and the coating film in the mold.

Therefore, Appellants submit that Doane does not teach or suggest "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film" as recited in independent claim 1.

For at least the reasons stated above related to independent claim 1, Appellants asserts that this claim is patentable. Due at least to the dependence of claims 2-8, 12-19, 26-30, 32, 34-36, 38 and 41 on claim 1, Appellants also assert that these claims are patentable.

b. Independent Claim 6

For at least the reasons given below, Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or a combination thereof teaches or suggests "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 6.

i. A PRIMA FACIE CASE OF OBVIOUSNESS HAS NOT BEEN ESTABLISHED

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness when rejecting claim 6. In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation or success. Finally, the prior art reference or knowledge generally available to one of ordinary skill in the art must teach or suggest all the claim limitations.

[18] See method described in *Doane* at col. 3, line 67 to col. 4, line 19.

Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or combination thereof teaches or suggests all the claim limitations as disclosed in claim 6.[19]

Further, in the Response to Arguments section of the Final OA,[20] the Examiner cites *In re Keller*[21] as stating "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references". Looking closer at the facts of *In re Keller*, the CCPA affirmed the Board's decision that, under the facts of the case, one cannot show objective evidence of non-obviousness by "attacking references individually" when the rejection is based upon a combination.[22] However, the rebuttal evidence consisted only of a single affidavit that only attacked the single secondary reference, and thus, was insufficient evidence of non-obviousness to overcome the rejection.

However, where **none** of the references teach or suggest a particular limitation of the claimed invention, each of the references can be attacked individually to show that the combination fails to support a prima facie case of obviousness. Appellants are arguing against both of the cited references and the combination thereof rather than a singular secondary reference, and therefore, the facts of *In re Keller* do not apply.

ii. NEITHER ANDERSEN, DOANE NOR THE COMBINATION THEREOF TEACHES OR SUGGESTS ALL OF THE LIMITATIONS AS RECITED IN INDEPENDENT CLAIM 6

The Final OA acknowledges that Andersen fails to disclose all of the limitations of claim 6, for example, providing a coating film distinct from the molding material or

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[19] "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found that the claimed invention to have been obvious in light of the teachings of the references.". *Ex parte Clapp* 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

[20] See Final OA, p. 12 at 30.

[21] *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

[22] See *In re Keller* at 425-426.

placing the molding material and the coating film into a mold having a given-shaped cavity, and relies on the teachings of Doane for these features of claim 6.[23]

In addition to the above-identified deficiency of Andersen, Appellants respectfully submit that neither Anderson, Doane nor the combination thereof teaches or suggests heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding as recited in independent claim 6. As Andersen does not provide the coating film distinct from the molding material, there is no pressure-bonding of the coating film to a surface of a biodegradable expanded molded article through steam expansion molding as recited in claim 6, but rather the mold is solely heated through the steam. In other words, Andersen only discloses heating a mold.[24] Andersen describes a coating material that melts to cover the surface of a mixture while the mixture (molding material) is being heated if the coating material is added during expansion molding.[25] Therefore, the method of Anderson is to mold a mixture through expansion and at the same time melt a coating material to form a coating film. Therefore, Appellants respectfully submit that Andersen does not teach or suggest "to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in independent claim 6.

The Examiner relies on Example 6 of Doane to teach "molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article" as recited in claim 6.

However, Appellants respectfully submit that Example 6 of Doane only discloses that "coating was accomplished by placing the films on one or both sides of the selected substrates, then placing the assembly between metal plates in a Carver press and compressing at an elevated temperature and pressure"[26]. The substrates in

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[23] See Final OA, p. 5, lines 12-14.
[24] See *Andersen*, column 45, lines 1-10.
[25] *Id.*, column 49, lines 13-20.
[26] See *Doane*, column 13, line 40 – column 14, line 31.

Doane are starch and PVOH blend films, for example. As such, the substrates would have been already molded before the coating was accomplished. Accordingly, Appellants submit that no steam expansion occurs by compressing the substrates at an elevated temperature and pressure. Therefore, Example 6 of Doane neither discloses nor suggests molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article as recited in claim 6.

Furthermore, the Examiner asserts that "(Doane) teaches that...the coating material is *not* mixed with foam material, but coating material is provided separately from the molding material".[27]

However, Appellants respectfully submit that the Examiner confuses (i) the expanded molded article (foam material) of a non-fluid state which is obtained through the expansion molding with (ii) the slurry or dough molding material of a fluid state which is prepared before the expansion molding. The expanded molded article and the slurry or dough molding material are utterly different in state (fluid state or non-fluid state), and therefore cannot be considered to be identical. Doane teaches that the coating material is provided without being mixed with foam material, that is, the coating material is provided separately from the expanded molded article[28], which is acknowledged also by the Examiner.[29] As such, Doane neither teaches nor suggests a coating film distinct from the slurry or dough molding material being placed into a mold along with the slurry or dough molding material as recited in claim 6.

The Examiner also asserts that the compression molding technique for applying the coating material of Doane inherently teaches that the invention is capable of applying the coating film with a desired bond on the surface molding material into a mold.[30] However, the compression molding technique of Doane is applied to the expanded molded article (self-supporting structure) after the expansion molding[31] is completed. As such, Appellants submit that the

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[27] See Final OA, p. 13, lines 11-16.
[28] See *Doane*, column 4, lines 41-51.
[29] See Final OA, p. 13, lines 11-16.
[30] See Final OA, p. 13, lines 16-20.
[31] See *Doane*, col. 3, line 67 through col. 4, line 19.

compression molding technique for applying the coating material of Doane does not suggest "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 6.

In addition, according to the Examiner, Doane teaches that the polyester film is provided on the thermoformed ribbons of the starch, foam material, ... and thus, such a statement indicates that Doane is capable to apply the coating material on the surface of the molding material by using heat expansion; and a pressure bonding process, in order to melt or soften the coating layer and press bond on the surface the molding material as claimed.[32]

However, as is clear from the description of Doane[33], the method using the thermoformed ribbons is a method in which rigid thermoformed ribbons are compressed so as to assume the shape of the mold cavity, films are placed on the thermoformed ribbons after the mold is opened, the laminates are returned to the molds, and the films are bonded to the thermoformed ribbons. As such, examples of Doane neither disclose nor suggest the feature of claim 6 in which "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article".

Further, Doane states that the hydroxyl-functional polyester is **adherently carried** on the surface of the self-supporting structure and that the polyester **self-adheres** to the surface through brushing, dipping, spraying, compression molding, coextruding and hot roll laminating[34], none of which includes a steam expansion molding method as recited in claim 6. The Examiner asserts that the description in Doane relating to the compression molding of a coating material suggests that Doane is capable of providing a coating film and molding material in a mold during a molding process[35]. However, Appellants submit that the disclosure in Doane is made in relation to the coating of the surface of a self-supporting structure, which is molded in

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[32] See Final OA, p. 13, line 20 through p. 14, line 2.
[33] See *Doane*, col. 16, lines 56-63.
[34] *Id.*, at column 4, lines 21-22 and 47-48.
[35] See Final OA, p. 13, lines 26-28.

advance[36], and therefore, Doane does not suggest combining the slurry or dough molding material and the coating film in the mold.

Therefore, Appellants submit that Doane does not teach or suggest "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film" as recited in independent claim 6.

For at least the reasons stated above related to independent claim 6, Appellants asserts that this claim is patentable. Due at least to the dependence of claims 29-30, 32, 36, 38 and 41 on claim 6, Appellants also assert that these claims are patentable.

c. Independent Claim 13

For at least the reasons given below, Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or a combination thereof teaches or suggests "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 13.

i. A PRIMA FACIE CASE OF OBVIOUSNESS HAS NOT BEEN ESTABLISHED

Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness when rejecting claim 13. In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation or success. Finally, the prior art reference or knowledge generally available to one of ordinary skill in the art must teach or suggest all the claim limitations.

[36] See method described in *Doane* at col. 3, line 67 to col. 4, line 19.

Appellants submit that the Examiner has at least failed to illustrate where Andersen, Doane or combination thereof teaches or suggests all the claim limitations as disclosed in claim 13.[37]

Further, in the Response to Arguments section of the Final OA,[38] the Examiner cites *In re Keller*[39] as stating "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references". Looking closer at the facts of *In re Keller*, the CCPA affirmed the Board's decision that, under the facts of the case, one cannot show objective evidence of non-obviousness by "attacking references individually" when the rejection is based upon a combination.[40] However, the rebuttal evidence consisted only of a single affidavit that only attacked the single secondary reference, and thus, was insufficient evidence of non-obviousness to overcome the rejection.

However, where **none** of the references teach or suggest a particular limitation of the claimed invention, each of the references can be attacked individually to show that the combination fails to support a prima facie case of obviousness. Appellants are arguing against both of the cited references and the combination thereof rather than a singular secondary reference, and therefore, the facts of *In re Keller* do not apply.

ii. NEITHER ANDERSEN, DOANE NOR THE COMBINATION THEREOF TEACHES OR SUGGESTS ALL OF THE LIMITATIONS AS RECITED IN INDEPENDENT CLAIM 13

The Final OA acknowledges that Andersen fails to disclose all of the limitations of claim 13, for example, providing a coating film distinct from the molding material or

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[37] "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found that the claimed invention to have been obvious in light of the teachings of the references.". *Ex parte Clapp* 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

[38] See Final OA, p. 12 at 30.

[39] *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

[40] See *In re Keller* at 425-426.

placing the molding material and the coating film into a mold having a given-shaped cavity, and relies on the teachings of Doane for these features of claim 13.[41]

In addition to the above-identified deficiency of Andersen, Appellants respectfully submit that neither Anderson, Doane nor the combination thereof teaches or suggests heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding as recited in independent claim 13. As Andersen does not provide the coating film distinct from the molding material, there is no pressure-bonding of the coating film to a surface of a biodegradable expanded molded article through steam expansion molding as recited in claim 1, but rather the mold is solely heated through the steam. In other words, Andersen only discloses heating a mold.[42] Andersen describes a coating material that melts to cover the surface of a mixture while the mixture (molding material) is being heated if the coating material is added during expansion molding.[43] Therefore, the method of Anderson is to mold a mixture through expansion and at the same time melt a coating material to form a coating film. Therefore, Appellants respectfully submit that Andersen does not teach or suggest "to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in independent claim 13.

The Examiner relies on Example 6 of Doane to teach "molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article" as recited in claim 13.

However, Appellants respectfully submit that Example 6 of Doane only discloses that "coating was accomplished by placing the films on one or both sides of the selected substrates, then placing the assembly between metal plates in a Carver press and compressing at an elevated temperature and pressure"[44]. The substrates in

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[41] See Final OA, p. 8, lines 3-5.
[42] See *Andersen*, column 45, lines 1-10.
[43] *Id.*, column 49, lines 13-20.
[44] See *Doane*, column 13, line 40 – column 14, line 31.

Doane are starch and PVOH blend films, for example. As such, the substrates would have been already molded before the coating was accomplished. Accordingly, Appellants submit that no steam expansion occurs by compressing the substrates at an elevated temperature and pressure. Therefore, Example 6 of Doane neither discloses nor suggests molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article as recited in claim 13.

Furthermore, the Examiner asserts that "(Doane) teaches that...the coating material is *not* mixed with foam material, but coating material is provided separately from the molding material".[45]

However, Appellants respectfully submit that the Examiner confuses (i) the expanded molded article (foam material) of a non-fluid state which is obtained through the expansion molding with (ii) the slurry or dough molding material of a fluid state which is prepared before the expansion molding. The expanded molded article and the slurry or dough molding material are utterly different in state (fluid state or non-fluid state), and therefore cannot be considered to be identical. Doane teaches that the coating material is provided without being mixed with foam material, that is, the coating material is provided separately from the expanded molded article[46], which is acknowledged also by the Examiner.[47] As such, Doane neither teaches nor suggests a coating film distinct from the slurry or dough molding material being placed into a mold along with the slurry or dough molding material as recited in claim 13.

The Examiner also asserts that the compression molding technique for applying the coating material of Doane inherently teaches that the invention is capable of applying the coating film with a desired bond on the surface molding material into a mold.[48] However, the compression molding technique of Doane is applied to the expanded molded article (self-supporting structure) after the expansion molding[49] is completed. As such, Appellants submit that the

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[45] See Final OA, p. 13, lines 11-16.
[46] See *Doane*, column 4, lines 41-51.
[47] See Final OA, p. 13, lines 11-16.
[48] See Final OA, p. 13, lines 16-20.
[49] See *Doane*, col. 3, line 67 through col. 4, line 19.

compression molding technique for applying the coating material of Doane does not suggest "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article" as recited in claim 13.

In addition, according to the Examiner, Doane teaches that the polyester film is provided on the thermoformed ribbons of the starch, foam material, ... and thus, such a statement indicates that Doane is capable to apply the coating material on the surface of the molding material by using heat expansion; and a pressure bonding process, in order to melt or soften the coating layer and press bond on the surface the molding material as claimed.[50]

However, as is clear from the description of Doane[51], the method using the thermoformed ribbons is a method in which rigid thermoformed ribbons are compressed so as to assume the shape of the mold cavity, films are placed on the thermoformed ribbons after the mold is opened, the laminates are returned to the molds, and the films are bonded to the thermoformed ribbons. As such, examples of Doane neither disclose nor suggest the feature of claim 13 in which "mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article".

Further, Doane states that the hydroxyl-functional polyester is **adherently carried** on the surface of the self-supporting structure and that the polyester **self-adheres** to the surface through brushing, dipping, spraying, compression molding, coextruding and hot roll laminating[52], none of which includes a steam expansion molding method as recited in claim 13. The Examiner asserts that the description in Doane relating to the compression molding of a coating material suggests that Doane is capable of providing a coating film and molding material in a mold during a molding process[53]. However, Appellants submit that the disclosure in Doane is made in relation to the coating of the surface of a self-supporting structure, which is molded in

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[50] See Final OA, p. 13, line 20 through p. 14, line 2.
[51] See *Doane*, col. 16, lines 56-63.
[52] *Id.*, at column 4, lines 21-22 and 47-48.
[53] See Final OA, p. 13, lines 26-28.

advance[54], and therefore, Doane does not suggest combining the slurry or dough molding material and the coating film in the mold.

Therefore, Appellants submit that Doane does not teach or suggest "placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film" as recited in independent claim 13.

For at least the reasons stated above related to independent claim 13, Appellants asserts that this claim is patentable. Due at least to the dependence of claims 34-35 on claim 13, Appellants also assert that these claims are patentable.

Therefore, in light of the above arguments with respect to claims 1, 6 and 13, the Appellants respectfully request that the rejection to claims 1-6, 12-18, 26-28, 32, 34-36, and 38 under 35 U.S.C. § 103(a) be withdrawn.

C. Claims 19 and 41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andersen in view of Doane, further in view of Okazaki EP 0679509 (Okazaki).

Appellants incorporate the discussion from above with respect to Andersen and Doane, and further submit that Okazaki also does not appear to describe or suggest, nor does the combination of Andersen, Doane and Okazaki, molding the slurry or dough molding material through steam expansion, and at the same time softening and pressure-bonding the coating film to a surface of a biodegradable expanded molded article as recited in claims 1 and 6.

Due at least to the dependence of claims 19 and 41 on claims 1 and 6, Appellants also assert that these claims are patentable.

The Appellants, therefore, respectfully request that the rejection to claims 19 and 41 under 35 U.S.C. § 103(a) be withdrawn.

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[54] See method described in *Doane* at col. 3, line 67 to col. 4, line 19.

VIII. CONCLUSION

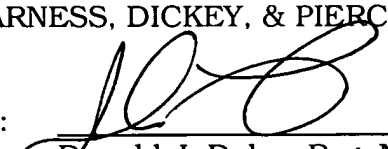
In light of the above arguments, the Board is respectfully requested to review and overturn the rejections to claims 1-8, 12-19, 26-30, 32, 34-36, 38, and 41 in connection with this application.

If the USPTO believes that personal communication will further the prosecution of this application, the Office is invited to contact Erin Hoffman, Reg. No. 57,752, at the telephone number below.

The Commissioner is authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By:  41,018

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IX. CLAIMS APPENDIX

1. (PREVIOUSLY PRESENTED) A method to manufacture a biodegradable molded article comprising the steps of:

providing a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water therewith;

providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity;

placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film~~,~~; and

heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding, wherein

said mold has an exhaust hole; and

in the heating and molding step, a gas existing between the coating film and a surface of the mold is discharged out of the cavity through the exhaust hole.

2. (ORIGINAL) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein

a space leading to the cavity through the exhaust hole is formed inside the mold, and

in the heating and molding step, the space is hermetically separated from outside the mold.

3. (ORIGINAL) A method to manufacture the biodegradable molded article as set forth in claim 2, wherein the hermetically separated space has a volume set between a third and twice that of a void in the cavity before heating and molding.

4. (ORIGINAL) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the gas existing between the coating film and a surface of the mold is discharged out of the mold through the exhaust hole in the heating and molding step.

5. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2.

6. (PREVIOUSLY PRESENTED) A method to manufacture a biodegradable molded article comprising the steps of:

providing a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto;

providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity;

placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film; and

heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the slurry or dough molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding,

wherein the given-shaped cavity of the mold has a deep drawing shape, and the molding material and the coating film placed therein are substantially flat for heating and molding to manufacture a biodegradable molded article of a deep drawing shape.

7. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein

a mold made up of a pair of a convex mold and a concave mold is used,

the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these two molds fit together, and

at least while the coating film is being deformed, the convex mold and the concave mold are straightly moved closer to each other.

8. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein

a mold made up of a pair of a convex mold and a concave mold is used,

the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these two molds fit together, and

at least until the coating film starts to deform, both the convex mold and the concave mold are moved closer to each other.

9. (ORIGINAL) A method to manufacture a biodegradable molded article comprising the steps of:

preparing: a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto; and a coating film mainly made of a biodegradable plastic and having hydrophobicity; and

heating and molding the molding material and the coating film in a mold having a given-shaped cavity to molding an expanded molded article through steam expansion by, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article,

a mold made up of a pair of a convex mold and a concave mold being used,

the molding material and the coating film being placed between the convex mold and the concave mold before the heating and molding,

in the heating and molding step, a central part of the coating film being deformed by moving at least either one of the convex mold and the concave mold in a direction wherein these two molds fit together, and at least while the coating film is being deformed, a relative moving speed of the convex mold to a plane formed by connecting a surface of non-deforming parts on an outer periphery of the coating film being maintained from 8 mm/s to 12 mm/s.

10. (ORIGINAL) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein the convex mold and the concave mold are straightly moved closer to each other at least while the coating film is deformed.

11. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein both of the convex mold and the concave mold are moved to approximate each other at least until the coating film starts to deform.

12. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the heating is done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than the melting point thereof.

13. (PREVIOUSLY PRESENTED) A method to manufacture a biodegradable molded article comprising the steps of:

providing a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto;

providing a coating film distinct from the slurry or dough molding material and mainly made of a biodegradable plastic and having hydrophobicity;

placing the slurry or dough molding material and the coating film into a mold having a given-shaped cavity to obtain a combination of the slurry or dough molding material and the coating film; and

heating and molding the combination of the slurry or dough molding material and the coating film in the mold to mold the biodegradable expanded molded article through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article,

said heating being done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than a melting point thereof.

14. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 12, wherein the heating is done so that the mold has a temperature not less than 130°C.

15. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 12, wherein the heating is done so that the mold has a temperature not less than 150°C.

16. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein a slip agent is applied to a surface of the mold contacting the coating film before the heating and molding.

17. (ORIGINAL) A method to manufacture the biodegradable molded article as set forth in claim 16, wherein the slip agent is a fluoroplastic layer formed on a surface of the mold.

18. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the coating film is a film mainly made of a denatured polyester.

19. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the coating film is a biaxially stretched film.

20.-25. (CANCELLED).

26. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 2, wherein the exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2.

27. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 3, wherein the exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2.

28. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 4, wherein the exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2.

29. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein

a mold made up of a pair of a convex mold and a concave mold is used,

the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these two molds fit together, and

at least while the coating film is being deformed, the convex mold and the concave mold are straightly moved closer to each other.

30. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein

a mold made up of a pair of a convex mold and a concave mold is used,

the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these two molds fit together, and

at least until the coating film starts to deform, both the convex mold and the concave mold are moved closer to each other.

31. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 10, wherein both of the convex mold and the concave mold are moved to approximate each other at least until the coating film starts to deform.

32. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein the heating is done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than the melting point thereof.

33. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein the heating is done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than the melting point thereof.

34. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 13, wherein the heating is done so that the mold has a temperature not less than 130°C.

35. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 13, wherein the heating is done so that the mold has a temperature not less than 150°C.

36. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein a slip agent is applied to a surface of the mold contacting the coating film before the heating and molding.

37. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein a slip agent is applied to a surface of the mold contacting the coating film before the heating and molding.

38. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein the coating film is a film mainly made of a denatured polyester.

39. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein the coating film is a biaxially stretched film.

40. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 9, wherein the coating film is a film mainly made of a denatured polyester.

41. (PREVIOUSLY PRESENTED) A method to manufacture the biodegradable molded article as set forth in claim 6, wherein the coating film is a biaxially stretched film.

42.-43. (CANCELLED).

***** END CLAIM LISTING *****

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.